describe to a person in another the exact shade or tint meant by a given name. The production of a work which would obviate these difficulties and make available what might be called the "constants of nature" in colour, is directly in line with previous publications of the Institution in endeavouring to establish standards whereby a definite nomenclature in scientific and popular writing might be introduced.

Prof. Langley, after consulting with others expert in the matter, decided that it would be desirable, not only to secure more permanent tints, but to connect every tint published in the book with some definite wave-length in the spectrum, whether the solar spectrum or a composite one. The investigations of Prof. Rood and others show that it is difficult to do this directly, but that it can be effected by the use of intermediate means of comparison.

Again, experiments must be made to determine how far this large object (of connecting every tint employed with some definite wave-length or combination of wave-lengths of light) is practicable. If it be fully so, the work may be said to be in one sense something absolutely permanent, relating as it will to standards which can never alter with time, so that, as has been said, those who expect that their writings will be more permanent than the planet itself should take this method of illustrating them. The work promised such magnitude that a committee was appointed, and is now considering the subject.

Collected Papers.—The General Appendix to the Annual Report of the Smithsonian Institution may be termed a "source-book" of scientific history. In consists of reprints and translations of authoritative but popular scientific articles which appeared during the year of the Report. Some are addresses delivered in institutions concerned with the diffusion of knowledge, and others are papers contributed to scientific and other periodicals, and collectively they form an epitome of advance and opinion in all departments of science. There are in the volume before us (1899) no less than thirty papers of this kind, among them being translations of the following: influence of the wave-theory of light on modern physics, by Prof. Cornu; on the sense of smell in birds, by M. X. Raspail; have fishes memory? by Herr L. Edinger; the garden and its development, by Dr. P. Falkenberg; sea-charts formerly used in the Marshall Islands, with notices on the navigation of these islanders in general, by Captain Winkler; the peopling of the Philippines, by Dr. R. Virchow; list of the native tribes of the Philippines and of the languages spoken by them, by Prof. F. Blumentritt; and the sculptures of Santa Lucia Cozumahualpa, Guatemala, in the Hamburg Ethnological Museum, by Herr Herman Strebel.

National Museum.—Details in regard to the work of the U. S. National Museum are given in an appendix to Prof. Langley's report. To the geological collections were added some interesting fossil animals secured from the fields of Wyoming, and a large amount of zoological material was collected in Cuba and Porto Rico. There has also been transferred to the Museum the extensive and very valuable series of vertebrate fossils collected by the late Prof. Marsh during his connection with the United States Geological Survey. This collection aggregated five car-loads, and is particularly rich in specimens of the gigantic Dinosaurs, besides fifty skulls of Titanotherium, probably the best specimens in existence.

The Annual Report of the Museum for 1899 is largely devoted to a description of the collection of non-metallic minerals in the department of applied geology, by Mr. G. P. Merrill. The term non-metallic is used to designate minerals which, as exhibited in the Museum, are utilised in other than metallic forms. The subjects of remaining papers in the Report are:—A Primitive frame for weaving narrow fabrics, and pointed bark canoes of the Kutenai and Amur, by Dr. O. T. Mason; an early West Virginia pottery, by Mr. W. Hough; and a descriptive catalogue of a collection of objects of Jewish ceremonial in U. S. National Museum, by Drs. C. Adler and I. M. Casanowicz.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

DR. G. S. TURPIN, headmaster of the Swansea Intermediate and Technical School, has been appointed to succeed Dr. Gow as headmaster of the Nottingham High School. Particulars as to the vacancy thus caused at Swansea will be found in our advertisement columns.

THE council of University College, London, have appointed Mr. J. D. Cormack, of the University of Glasgow, to the chair of mechanical engineering in this College, vacant by the resignation of Prof. Hudson Beare on his appointment as regius professor at Edinburgh.

The Education Bill (No. 2), was read a second time in the House of Commons on Tuesday, after a long and animated debate. As a consequence of the Cockerton judgment, the question had to be determined whether School Boards were the proper authorities to deal with secondary education or not; and the Government decided against them. The Bill is the first step towards the establishment of single local authorities connected with County Councils for the control of the whole of the work of secondary education in their districts.

THE Liverpool City Council unanimously adopted the following resolution at a meeting held on July 3:—"That the Council has observed with much satisfaction the growth and progress of the University College, and in view of the fact that the college authorities are taking steps to procure the establishment of a separate University for Liverpool records its opinion that it is desirable in the interests of higher education in the city that such a University should be established." It is understood that, though there has not yet been any appeal to the public, about 100,000*l.* has already been promised for Liverpool University, which will bring up the capital value of University College to about 600,000*l.*, and the promoters are sanguine that there will be little difficulty in raising this to 750,000*l.* The council of University College have elected Dr. E. W. Marchant to the lectureship in electrotechnics vacated by Mr. Alfred Hay's appointment to a professorship at Coopers Hill.

THE University of Birmingham is fortunate in having a strong man like Mr. Chamberlain to plead its cause and advance its interests. At the first congregation of the University, held on Saturday last, he again directed attention to the national importance of higher education and research, and referred to the liberal provision made for work of this kind in other countries. "I am convinced," he said, "that unless we overcome the innate conservatism of our people in regard to the application of the highest science to the commonest industries and manufactures in our land, we shall certainly fall very far behind in the race." Though the fact involved in this statement has been persistently brought forward in NATURE for many years. it cannot be too frequently reiterated in public to rouse wealthy citizens to a sense of their responsibilities as regards provision for national progress, and create a higher regard for scientific work than is at present possessed by Englishmen in general. It is not necessary to enlarge here upon the facilities for scientific work abroad, for scarcely a week passes without our having to record munificent donations by States and individuals for the erection of buildings in which such work can be carried on under favourable conditions. Mr. Chamberlain mentioned in his address that the Charlottenburg Technical High School cost half a million of money, and this is but one instance of many. A modern University ought at least to secure an equal sum of money to build and equip its scientific side, especially when the ideals are those sketched by Mr. Chamberlain in the following words:—"I venture to lay down four qualifications as necessary to a perfect University. In the first place, it should be an institution where all existing knowledge is taught. Such a University may, perhaps, never yet have been attained; want of means may always prevent it, but at least that was the object at which we should aim, and we should never rest satisfied until we can say that no student desirous of instruction in any branch of learning shall be turned hungry away from the doors of this University. No doubt the enormous development of knowledge, and especially of its scientific side, during the present century requires a certain specialisation in the teaching of that knowledge, and I think it may be desirable, I think it may be necessary, that Universities also should be specialised, and that one University should pay more attention than another to particular studies; but I believe at the same time that it would be fatal if in our desire as a modern University to give a special development to the practical and thorough teaching of our scientific work, it would be a great mistake, I say, if we were to exclude or to neglect the older branches of learning. Well, then, in the second place a University is a place where the knowledge that has been acquired has to be tested. And as to that I will only say that in the multiplication of examining bodies I hope that nothing will be done, either by us or by our successors, to lower the standards of proficiency, whether in

the ordinary pass or in the highest honours. Then the third feature to which I should call attention, and which I am inclined to say is the most important of all, is that a University should be a place where knowledge is increased and where the limits of learning are extended. Original research, the addition of something to the total sum of human knowledge, must always be an essential part of our proposals. We want to secure that those who teach in this University shall never cease to learn, and that those who are students shall unite with them in the work of fresh and new investigation. And, lastly, a University is a place where the application of knowledge must be indicated and directed. That perhaps brings us nearer to what may yet be the distinctive feature of our University. At all events we start with the belief that here we are going to combine theory with practice, and to see that in our University we shall combine both in one course of instruction, with due regard to the needs of our own time and of our own district. And now, if I may summarise in one sentence what I have been saying, it is that a University should be a place where knowledge is taught, tested, increased and applied."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Meteorological Society, June 19.—Mr. W. H. Dines, president, in the chair.—A paper by Mr. H. Helm Clayton, of the Blue Hill Observatory, U.S.A., on the eclipse cyclone, the diurnal cyclones and the cyclones and anti-cyclones of temperate latitudes, was read by the secretary. The author has discussed the meteorological observations made along the path of the total solar eclipse in the United States on May 28, 1900, and also those made during three previous eclipses. He finds that a cyclone follows in the wake of the eclipse—though the changes are very minute and feeble—the fall of temperature developing a cold-air cyclone in an astonishingly short time, with all the peculiar circulation of winds and distribution of pressure which constitute such a cyclone.—A paper, by Mr. F. Napier Denison, of Victoria, British Columbia, on the seismograph as a sensitive barometer, was also read by the secretary. A Milne seismograph was installed in 1898 at the Meteorological Office, Victoria, B.C., and the author has since that time compared its movements with the changes of atmospheric pressure recorded by his "aerograph." He finds that when the barometric pressure is high over the Pacific slope from British Columbia southward to California, while off the Pacific coast the barometer is comparatively low, the horizontal pendulum of the seismograph tends to move towards the eastward. This movement appears to be due to a distortion of the earth's surface, caused by the heavier air over the Pacific slope depressing the underlying land surface below its normal position, while, on the other hand, the comparatively light air over the adjacent ocean tends to allow the sea and earth beneath to rise above its normal level. It has been found that when an extensive storm area is approaching from the westward, and often eighteen to twenty-four hours before the local barometer begins to fall, the pendulum of the seismograph swings steadily to the eastward, completely masking any diurnal fluctuations that might have existed, as the storm area approaches, and in the event of it being followed by an important high area, the pendulum will begin to swing towards the westward before it is possible to ascertain this area's position on the current weather charts.

Anthropological Institute, June 19.—Extraordinary joint meeting with the Folklore Society. Prof. A. C. Haddon, F.R.S., in the chair.—Prof. Haddon vacated the chair in favour of Mr. E. W. Brabrook, president of the Folklore Society.—Mr. E. S. Hartland exhibited the collection of Musquakie beadwork and other objects presented by the late Miss Florence Grove to the Folklore Society, and to be deposited in the Museum of Ethnology at Cambridge.—Mr. R. Shelford exhibited two charms against stomach-ache from Borneo.—Mr. H. Balfour read a paper, by Mr. W. G. Aston, C.M.G., on Japanese Gohei and Ainu Tirao.—Mr. N. W. Thomas read a paper, by Mr. E. Tregear, on the spirit of vegetation.

DUBLIN.

Royal Dublin Society, May 22.—Sir Howard Grubb, F.R.S., in the chair.—Prof. Hartley, F.R.S., and Mr. Hugh Ramage communicated a paper upon the banded flame-spectra of metals. This was a continuation of some former work on flame spectra at high temperatures by Prof. Hartley, published in the *Phil. Trans.*, in which it was shown that fluted and banded spectra are characteristic of many metals. The list is now extended, banded and fluted spectra of copper, gold, palladium, zinc, cadmium, aluminium, beryllium, lanthanium, indium and thallium have been photographed and the principal bands in their spectra measured. A banded spectrum has also been obtained from iridium. In well-defined groups, such as magnesium, zinc, cadmium, aluminium, indium and thallium, the spectra appear to be homologous.—Prof. Hartley communicated a paper on a theory of the molecular constitution of supersaturated solutions. The chemical constitution of these solutions, which exhibit the well-known phenomenon of sudden crystallisation when either a crystal of the same salt or one of the same constitution and isomorphous with it gains access to the liquid, has been thus explained by the author. When a supersaturated solution is formed the salt in solution is a definite hydrate, but it is not the same hydrated salt as that which crystallises out. The cause of the supersaturation is the greater solubility of the one hydrate over the other at a given temperature; and its conversion into the other by combination with some of the water, acting as a solvent, causes its sudden solidification. In cases where the supersaturated solution is prepared by digesting a dehydrated salt in cold water, the course of change is first hydration, secondly solution, and thirdly crystallisation. Reference is made to the work of H. Le Chatelier, Wyrouboff, and others.—Sir Howard Grubb communicated a note on a case of true stereoscopic effect obtained from a single picture, which he demonstrated by means of a model.—Mr. F. W. Moore exhibited and described a living specimen from the Botanic Garden, Glasnevin, Dublin, showing the germination of the double cocoa-nut (*Lodoicea sechellarum*).

EDINBURGH.

Royal Society, June 17.—Prof. Sir William Turner, K.C.B., in the chair.—Prof. Cossar Ewart, in a paper on in breeding, gave the results of a number of experiments he had tried on pigeons, rabbits, mares and goats, and examined in the light of these the views as to the injurious effects of in-breeding which were held by certain naturalists. Thus Darwin had concluded that in-breeding was injurious; other biologists, including Weissmann, that it was not. Similarly, Huth and Westermark differed as to the harmfulness of consanguineous marriages. The general result of his own experiments led Prof. Ewart to the conclusion that in-breeding led to loss of constitutional vigour and sometimes of size, but not to loss of fertility; and the diversity of view held by naturalists he regarded as being due to the fact that members of one family often differed in constitution to a marked degree, brothers and sisters, for example, differing more than their parents, and there being occasionally greater similarity between second cousins than between first cousins. It was also pointed out that, in certain circumstances, in-breeding by arresting reversion (which was favoured by crossing) tended to favour the appearance of new varieties.—Mr. F. H. A. Marshall read a paper on hair in the Equidæ. It was found that the hairs of the three principal types of zebra were fairly distinct, while the Somali zebra stood quite by itself, a conclusion agreeing with that of Nathusias. The hairs of horses showed considerable variability dependent largely on the breed, while those of zebra-horse hybrids, so far as the observations went, were fairly constant in character. The hairs of the mane, as well as those from the sides of the body, were also dealt with. The paper concluded with a reference to a suggestion by Nathusias that, if the telegony hypothesis were true, we might expect to find evidence of it in the hair characters of the "subsequent foals." Such evidence was, however, utterly lacking.

PARIS.

Academy of Sciences, July 1.—M. Fouqué in the chair.—Chemical equilibria; phosphoric acid and the chlorides of the alkaline earths, by M. Berthelot. The author's recent experiments on the subject are continued, the reactions dealt with in this paper being those occurring between phosphoric acid, monosodium phosphate or disodium phosphate, and calcium, barium or magnesium chloride. It is found that the number of equivalents of the alkaline earth entering into combination with a molecule of precipitated phosphoric acid varies from 2 to 4, according to the nature of the substances and the time which has elapsed since the commencement of the reaction.—New treatment of niobite; preparation and properties of fused niobium, by M. Henri Moissan. The native mineral, consisting chiefly of niobic and tantalic acids together with iron, man-